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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/786,388

02/25/2004

Christof Streck

2000.110400

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23720

7590

11/13/2006

WILLIAMS, MORGAN & AMERSON  
10333 RICHMOND, SUITE 1100  
HOUSTON, TX 77042

EXAMINER

TRAN, BINH X

ART UNIT

PAPER NUMBER

1765

DATE MAILED: 11/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/786,388

Applicant(s)

STRECK ET AL.

Examiner

Binh X. Tran

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 October 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 38-50 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 45-50 is/are allowed.
- 6) ☒ Claim(s) 38-43 is/are rejected.
- 7) ☒ Claim(s) 44 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10-30-2006 has been entered.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 38, 40-41, 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ryu et al. (US 2002/0146888 A1) in view of Riley et al. (US 2002/0119647 A1).

Respect to claim 38, Ryu discloses a method comprising the step of:

forming a doped region of a specified doping profile in a silicon region adjacent to a gate electrode (18) having sidewall spacers (20) formed therein (Fig 1, paragraph 0021);

performing a first etching process to remove the first oxidized portion (22) of said doped regions (paragraph 0021-0022);

performing an oxidation process to form a second oxidized portion (34) of said doped region (Fig 3, paragraph 23);

performing a second etching process to remove said second oxidized portion of said doped region (Fig 4, paragraph 0024)

epitaxially growing a silicon layer (36) on said doped regions after removing said second oxidized portion of said doped region (paragraph 0025, Fig 5).

Ryu fail to explicitly disclose the step of forming a first oxidation process to form a first oxidized portion. However, Ryu clearly teaches the present of the first oxidized portion (24). Riley teaches to use oxidation process, CVD or the like to form an oxide layer (40) (See paragraph 0031). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Ryu in view of Riley by using oxidation process to form the first oxide portion because equivalent and substitution of one for the other would produce an expected result.

Respect to claim 40, Ryu fails to disclose the first and second etching processes employ a diluted etch solution comprising ammonium hydroxide and hydrogen peroxide (APM). However, Ryu clearly teaches to use wet etching solution to remove oxide material for the first and second etching processes. Riley teaches to use a solution comprises ammonium hydroxide and hydrogen peroxide (APM) to remove oxide material because it results in a control etch rate and etch uniformity (paragraph 0033-0036). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Ryu in view of Riley by using a solution comprises ammonium hydroxide and hydrogen peroxide because it would result in a control etch rate and etch uniformity.

Respect to claim 41, Riley teaches a to clean a surface prior to performing the first oxidation process to remove any residues or other impurities (paragraph 0031). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Ryu in view of Riley by cleaning a surface of the doped region prior to performing the first oxidation process because the cleaning process will remove any residues or other impurities.

Respect to claim 43, Ryu teaches the step of forming a metal silicide in the grown silicon layer (paragraph 0025).

5. Claim 39, 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ryu and Riley as applied to claims 38, 40-41, 43 above, and further in view of Wake (US 6,725,119).

Respect to claim 39, Ryu and Riley fails to disclose the dilute etch solution comprise HF, hydrogen peroxide, and water. However, Riley clearly discloses the dilute etch comprises ammonium hydroxide, and hydrogen peroxide. In a semiconductor process, Wake teaches to use either a mixed solution of HF and hydrogen peroxide or a mixed solution of ammonium hydroxide and hydrogen peroxide (col. 9 lines 20-29, col. 30 lines 50-60). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Ryu and Riley in view of Wake by using HF and hydrogen peroxide solution because equivalent and substitution of one for the other would produce an expected result.

Respect to claim 42, Riley discloses the etching processes are performed using a spray tool to facilitate both etch rate and etch uniformity (paragraph 35). It would have been obvious to one having ordinary skill in the art, at the time of invention, to use a spray tool for the etching processes because it will facilitate both etch rate and etch uniformity.

***Allowable Subject Matter***

6. Claim 44 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
7. Claims 45-50 are allowed.
8. The following is a statement of reasons for the indication of allowable subject matter: Respect to claim 44, the cited prior arts fail to disclose or suggest that after removing the first oxidized portion of said doped region, performing a heat treatment

process on the doped regions prior to performing said second oxidation process in combination with all other limitation in the claims. Respect to claims 45-50, the cited prior arts fail to disclose or suggest after removing the first oxidized portion of said doped region, performing a heat treatment process on the doped regions and after performing the heat treatment process, performing a second oxidation process to form a second oxidized portion of the doped regions in combination with all other limitations in the claims

***Response to Arguments/Amendment***

9. New ground of rejections were set forth (see rejection above) to discuss applicant's new claims 38-43.

***Conclusion***

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Binh X. Tran whose telephone number is (571) 272-1469. The examiner can normally be reached on Monday-Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

Art Unit: 1765

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

*Binh Tran*

Binh X. Tran